Section 4 Supply chain resilience and critical minerals

Supply chain disruption risk faced by companies has recently become more diverse. Another challenge is how to respond to natural disasters, regional conflicts, pandemics, political instability in countries that are investment destinations or procurement sources, abrupt changes in the business environment due to policy changes, and sustainability-related matters, including climate change and human rights. Enhancement of supply chain resilience as an international agenda item has come to attract attention since the COVID-19 pandemic. In the G7 Leaders' Communique and G7 Trade Ministers' Communique[133] issued in 2021, a reference was made to the importance of enhancing supply chain resilience during the phase of recovery from the COVID-19 shock, and since then, discussions have continuously been held on this matter.

This section will look at an overview of the background to the enhancement of supply chain resilience in Japan, the progress in discussions and initiatives in major countries and at international forums and developments related to the enhancement of supply chain resilience concerning critical minerals, which has been attracting attention in recent years.

1. Background to enhancement of supply chain resilience

(1) Definition of supply chain resilience

The OECD defines supply chain resilience as a supply chain's ability to return to normal operation after being disrupted. Examples of disruption cited by the OECD include conflicts, wars, natural disasters due to extreme weather events, continuous geopolitical tensions, regulatory uncertainty, economic cycle changes, cyberattack threats, and frequent congestion, shortages of labor and containers, and price rises resulting from pressures exerted by those factors on logistics and transportation.[134] At the company level, supply chains are supposed to bring productivity improvement in exchange for the cost of developing relationships with suppliers, but vulnerability to change at the time of disruption, difficulty of collecting information, and how to secure substitution ability and diversity could become challenges.[135] Not only supporting companies' response to the challenge of enhancing supply chain resilience but also addressing economy-wide risk for stable supply has come to be recognized as an important policy challenge for governments. Under the Economic Security Promotion Act of Japan, enacted in 2022, the government is required to designate critical products which are vital for the survival of citizens or on which their daily lives or the economic activities depend widely as specified critical products and enhance supply chain resilience concerning those products by supporting private-sector business operators engaging in initiatives to ensure stable supply of the products.[136]

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[133] Ministry of Foreign Affairs, "Carbis Bay G7 Summit Communiqué," https://www.mofa.go.jp/mofaj/files/100200009.pdf (as viewed on June 5, 2025); Ministry of Foreign Affairs, "G7 Trade Ministers' Communiqué (provisional translation)," https://www.mofa.go.jp/mofaj/files/100195648.pdf (as viewed on June 5, 2025)

[134] OECD (2025)

[135] Todo (2025)

[136] Cabinet Office, "SAPURAI CHEEN KYOUJINKA NO TORIKUMI (JUUYOU BUSSI NO ANTEITEKI NA KYOUKYUU NO KAKUHO NI KANSURU SEIDO)," https://www.cao.go.jp/keizai_anzen_hosho/suishinhou/supply_chain/supply_chain.html (as viewed on June 5, 2025)

(2) Background to initiatives in Japan

In Japan, since before the COVID-19 pandemic, awareness about supply chain risks has grown and initiatives to enhance supply chain resilience have been conducted. Traditionally, there has been strong awareness about Japan's vulnerability concerning the procurement of resources and fuels, exemplified by the oil shocks in the 1970s. In addition, the restrictions introduced by China on exports of rare earths in 2010 raised awareness about the risk of depending heavily on that country for the supply of raw materials. In response to the export restrictions imposed by China, Japan conducted initiatives such as (i) developing upstream development projects to secure alternative supply sources, (ii) promoting energy conservation through research and development, and (iii) working to halt the Chinese export restrictions by filing a complaint with the WTO. As a result, China's share in Japan's overall imports of rare earths fell from 85% in 2009 to 58% in 2020.[137]

At the time of the Great East Japan Earthquake in 2011, many factories were damaged. In particular, as a result of the damage caused to some major semiconductor-manufacturing factories, many automakers and other manufacturers of final products were unable to obtain semiconductors necessary for the production of their products and were forced to reduce production. That incident raised awareness about the importance of enhancing resilience by securing safety stocks so that production capacity can be maintained in emergencies, rather than merely pursuing efficiency improvement in normal times.[138] In addition, after each large-scale disaster, including the floods in Thailand that occurred in the same year, more and more companies formulated business continuity plans (BCP) in view of the experience of production reduction or suspension due to supply disruption for parts and materials.

At the time of the COVID-19 pandemic in 2020, supply chain disruptions occurred around the world. In particular, due to disruptions to the supply of parts and materials from China, production in Japan stalled, raising concerns about the risk of procurement from abroad. Concerning emergency goods such as medical products, shortages of goods occurred amid explosive expansion of demand. This situation raised awareness about the need to reconsider the balance between the economic rationality and efficiency achieved by geographical concentration of production and the ability to respond to supply disruption risk. Furthermore, when Russia's aggression against Ukraine started in 2022, awareness grew further about supply chain supply risks concerning strategic goods, such as energy and resources for imports of which Japan depends significantly on Russia.

Moreover, in recent years, against the backdrop of geopolitical conflicts, including the U.S.-China conflict, there are growing concerns about some countries' attempts to force other countries to change policies in ways favorable for their own interests by applying economic pressures, such as export restrictions on critical goods, tariff hikes and denial of customs clearance, a behavior known as economic coercion. In some cases, boycotting and import restrictions are used as a means of economic coercion,

[137] Ministry of Economy, Trade and Industry, "SHIRYOU 3: KOUBUTSU SEISAKU WO MEGURU JOUKYOU NI TSUITE" (material at the 1st meeting of the Mining Subcommittee of the Manufacturing Industry Committee of the Industrial Structure Council), October 28, 2024, https://www.meti.go.jp/shingikai/sankoshin/seizo_sangyo/mining/pdf/001_03_00.pdf (as viewed on June 5, 2025)

[138] Ministry of Economy, Trade and Industry (2021)

so in addition to possible disruption on the side of procurement sources, possible disruption on the side of sales destinations has emerged as a risk.[139]

In response to this situation, the government has supported the multiplication of foreign production bases by companies and also assisted the development of domestic production bases. Under the Economic Security Promotion Act of Japan, enacted in 2022, the government has established an institutional system concerning the enhancement of supply chain resilience (a system to secure stable supply of critical products) as one of the four pillars. Under the law, the government has designated specified critical products[140] and is supporting initiatives by private-sector companies, including investment in production facilities, and research and development.

2. Progress in national policies for enhancing supply chain resilience

Here, we will look at the progress in national and international initiatives to enhance supply chain resilience in recent years. Regarding products for which there is a significant supply chain disruption risk due to high geographical concentration of production bases and products that are critical from the perspective of national security, countries are implementing policies for enhancing supply chain resilience, such as identifying specific risks and strengthening industrial infrastructure through industrial policies in light of the identified risks. As resilient supply chains cannot be realized by any single country alone, international cooperation with allied countries and like-minded countries, among other parties, including in responding to economic coercion, is essential, so discussions and initiatives are ongoing at the G7 and various other forums.

(1) United States

Based on an executive order signed by President Biden in February 2021 (Executive Order 14017), the United States has been implementing initiatives to enhance supply chain resilience, such as conducting a survey concerning critical products, including semiconductors, large-capacity batteries, critical minerals/raw materials, and pharmaceuticals. In August 2022, the Inflation Reduction Act, which aims to promote investment in measures to address climate change, and the CHIPS and Science Act, which is intended to support the manufacturing of semiconductors, among other activities, were enacted, and policies placing emphasis on promoting domestic investment and enhancing supply chain resilience have been implemented. The Inflation Reduction Act calls for investments totaling around 370 billion dollars in climate change measures and aims to accelerate private-sector investment in the clean energy sector by reducing the energy cost through tax credits on the supply side (e.g., for private-sector companies) and on the demand side (e.g., for consumers) and also to strengthen critical supply chains.[141] The CHIPS and Science Act provides for subsidies totaling up to 39 billion dollars and a 25%

[139] Nihon Keizai Shimbun, "KEIZAITEKI IATSU NI DOU MUKIAU (JOU): KUNO ARATA, AJIA DAIGAKU KYOUJU," September 13, 2023, page 29 (morning edition)

[140] The items designated as specified critical products as of the end of March 2025 were as follows: antibacterial preparations, fertilizers, permanent magnets, machine tools/industrial robots, aircraft parts, semiconductors, storage batteries, cloud programs, natural gas, critical minerals, ship parts, and advanced electronic products (capacitors and wave filters).

[141] An executive order signed by President Trump in January 2025 required that the disbursement of funds appropriated under the Inflation Reduction Act be suspended immediately and that a review be submitted

investment tax credit for companies constructing or expanding semiconductor-manufacturing facilities in order to promote the domestic semiconductor industry.

In the 2021-2024 Quadrennial Supply Chain Review, announced in December 2024, the Biden administration concluded that broadly speaking, the following three initiatives were conducted in order to strengthen supply chains in the past four years: (i) Response to disruptions: The administration created the Supply Chain Disruptions Task Force (SCDTF) in response to supply chain disruptions caused by the COVID-19 pandemic, strengthened cooperation between the federal government, state governments and private-sector companies, and resolved the disruptions; (ii) Investment in infrastructure and the manufacturing industry and cost reduction: Investments made by the U.S. government since January 2021 induced private-sector investments totaling more than 1 trillion dollars, contributing to the establishment of new factories and job creation in the manufacturing industry; (iii) Response to non-market policies and practices (NMPP): In response to NMPP, which undermines the fair competitive environment, such as excessive state subsidies, the administration implemented tariff hikes for some products.[142,143]

Regarding critical minerals, the Department of Interior has designated "critical minerals," while the Department of Energy has designated raw materials related to the energy transition as "critical raw materials," and support based on various laws has been provided. Specifically, among the support measures implemented under the Biden administration are a tax credit for investment in production facilities for batteries and minerals under the Inflation Reduction Act, support for the construction of separation and refining facilities for heavy rare earths, graphite mining facilities, and production facilities for negative-electrode materials under the Defense Production Act, and subsidies for the production of batteries under the Infrastructure Investment and Jobs Act.[144]

President Trump, who took office in January 2025, signed an executive order to expand domestic production of minerals in March of the same year.[145] The order calls for promoting domestic production of minerals by identifying priority mineral production projects, speeding up permission, compiling a list of the federal government's holdings of land where mineral deposits exist, and providing business loans using the Defense Production Act.

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within 90 days. White House, "Unleashing American Energy," January 20, 2025, https://www.whitehouse.gov/presidential-actions/2025/01/unleashing-american-energy/ (as viewed on March 31, 2025)

[142] Based on Section 301 of the Trade Act, additional tariff hikes for steel, aluminum, semiconductors, EVs, and lithium-ion batteries used in EVs, among other items, were implemented.

[143] JETRO "BAIDEN BEI SEIKEN '2021-2024 NEN SAPURAI CHEEN REBYUU' HOUKOKUSHO WO HAPPYOU: TSUUSHOUHOU NO KOUSHIN WO TEIAN," December 20, 2024, https://www.jetro.go.jp/biznews/2024/12/9e433ace2ce19dd6.html (as viewed on February 28, 2025)

[144] An executive order signed by President Trump in January 2025 required that the disbursement of funds appropriated under the Inflation Reduction Act and the Infrastructure Investment and Jobs Act be suspended immediately and that government agencies submit a review within 90 days. White House, "Unleashing American Energy," January 20, 2025, https://www.whitehouse.gov/presidential-actions/2025/01/unleashing-american-energy/ (as viewed on March 31, 2025)

[145] White House, "Immediate Measures to Increase American Mineral Production," March 20, 2025, https://www.whitehouse.gov/presidential-actions/2025/03/immediate-measures-to-increase-american-mineral-production/ (as viewed on March 31, 2025)

(2) EU

As the EU imports many types of critical raw materials from China, the region is scrambling to diversify supply chains and mitigate supply chain risks. As part of the Green Deal Industrial Plan, announced in February 2023, the EU is reducing its dependence on countries and regions outside its area for sourcing of clean technology and critical minerals that contribute to decarbonization. The Net-Zero Industry Act, which was put into effect in June 2024, aims to increase manufacturing capacity concerning net-zero technologies within the EU area under the goal of meeting more than 40% of intra-EU demand by 2030.[146] The Critical Raw Materials Act, which was put into effect in May 2024, aims to ensure secure and sustainable supply of critical raw materials. In particular, regarding raw materials of high strategic importance, called "strategic raw materials," in order to secure intra-EU production capacity and diversify supply sources by 2030, the law has set the following benchmarks: at least 10% of the EU's annual consumption for extraction; at least 40% of the EU's annual consumption for processing; and at least 25% of the EU's annual consumption for recycling.[147]

As for the semiconductor sector, the European Chips Act, which aims to strengthen the semiconductor ecosystem in the EU area, was put into effect in September 2023. It aims to raise the EU's global market share in the semiconductor sector from the current 10% to 20% or higher by 2030 through public-sector and private-sector investments totaling 43 billion euros in the EU semiconductor industry.[148]

Under the EU's first "Economic Security Strategy," announced in June 2023, the European Commission has analyzed critical supply chains and identified risk levels together with member countries.[149] In October 2023, the European Commission unveiled a list of 10 technology areas subject to risk analysis and announced that it would conduct risk assessment together with member countries, starting with four of the 10 areas, specifically, advanced semiconductor technology, artificial intelligence technology, quantum technology and biotechnology.[150]

As a measure to respond to economic coercion, the Anti-Coercion Instrument (ACI) has been established (put into effect in December 2023). The ACI prescribes the procedures and criteria for implementing countermeasures (including tariff hikes, exclusion from government procurement, and the suspension of obligations under agreements, including export restrictions) as a last resort to be used when economic coercion has been exercised by a non-EU third country against the EU or EU member

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[146] European Commission, "The Net-Zero Industry Act: Making the EU the home of clean technologies manufacturing and green jobs," https://single-market-economy.ec.europa.eu/industry/sustainability/net-zero-industry-act_en (as viewed on February 28, 2025)

[147] European Commission, "EU secures access to diversified, affordable, and sustainable supply of critical raw materials," https://ec.europa.eu/commission/presscorner/detail/en/ip_24_2748 (as viewed on February 28, 2025)

[148] European Commission, "European Chips Act," https://digital-strategy.ec.europa.eu/en/policies/european-chips-act (as viewed on February 28, 2025)

[149] European Commission, "An EU approach to enhance economic security," January 20, 2023, https://ec.europa.eu/commission/presscorner/detail/en/IP_23_3358 (as viewed on February 28, 2025)

[150] European Commission, "Commission recommends carrying out risk assessments on four critical technology areas: advanced semiconductors, artificial intelligence, quantum, biotechnologies," October 3, 2023, https://ec.europa.eu/commission/presscorner/detail/en/ip_23_4735 (as viewed on February 28, 2025)

countries and when consultations have failed to halt coercion, thereby deterring coercion or offsetting its impact.

(3) China

Under the 14th Five Year Plan (2021-2025), China has launched the "dual circulation policy," which seeks to attract foreign investments and technologies by taking advantage of the allure of its huge market while maintaining the policy of opening up to the outside world (international circulation) and expanding domestic demand (domestic circulation) at the same time. In order to strengthen the capacity of independent and controllable supply chains, China is encouraging technology transfers from abroad while keeping the major portions of supply chains within the country, and at the same time, it is promoting domestic development of advanced core technology by making use of governmental investment funds and standards policy. China is developing deterrence against supply chain disruptions by intensively complementing vulnerabilities in order to establish self-sufficient industrial chains while strengthening foreign companies' dependence on China.

At the National People's Congress in March 2024, China announced an intention to accelerate the development of "new quality productive forces" and cited the promotion of optimization and advancement of industrial chains and supply chains and the development of emerging and future technologies as specific initiatives. The Resolution on Further Deepening Reform Comprehensively to Advance Chinese Modernization, adopted at the third plenary session of the 20th Central Committee of the Communist Party of China in July 2024, proclaimed that China will develop systems to enhance the resiliency and security of industrial chains and supply chains.

3. Current status of international initiatives

(1) G7

Regarding the G7, in the leaders' communique and trade ministers' communique issued in 2021, a reference was made to the importance of enhancing supply chain resilience during the phase of recovery from the COVID-19 pandemic, and since then, discussions have continuously been held. At the G7 Summit in Hiroshima in May 2023, G7 Leaders' Statement on Economic Resilience and Economic Security was adopted. The statement affirmed that the "principles on resilient and reliable supply chains"—(i) transparency, (ii) diversification, (iii) security, (iv) sustainability, and (v) trustworthiness and reliability—are essential for building and strengthening resilient supply chain networks among trusted partner countries both within and outside the G7. The statement also noted that the G7 would launch the Coordination Platform on Economic Coercion in order to increase collective assessment, preparedness, deterrence and response to economic coercion, and further promote cooperation. The statement indicated that under the coordination platform, the G7 would use early warning and rapid information sharing, and also coordinate, where appropriate, to support targeted states, economies and entities.

In the mineral resource sector, at the G7 Ministers' Meeting on Climate, Energy and Environment in Sapporo in April 2023, an agreement was reached on the Five-Point Plan for Critical Minerals Security, intended to overcome challenges related to critical minerals, for which global demand is growing, and it was affirmed that the G7 countries will cooperate on the following points: "forecast

long-term supply and demand," "develop resources and supply chains responsibly," "recycle more and share capabilities," "save with innovations," and "prepare for supply disruptions."

At the G7 Industry, Technology and Digital Ministerial Meeting in March 2024, discussions were held on enhancing supply chain resilience concerning semiconductors and other critical products. In particular, the importance of cooperating in pursuing resiliency of global supply chain in the digital industry was affirmed, and the semiconductors Point of Contact (PoC) Group, intended to promote information exchange between G7 members and share best practices, was established.

(2) Indo-Pacific Economic Framework for Prosperity (IPEF)

At a ministerial meeting of the Indo-Pacific Economic Framework for Prosperity (IPEF) held in November 2023 in the United States, the IPEF Supply Chain Agreement was signed as one of the four pillars of the IPEF, and the agreement was put into effect in February 2024. Under the agreement, countries that are parties to the agreement should identify critical sectors and products that may be seriously affected at the time of supply chain disruptions. The countries should develop action plans providing recommendations to increase the resilience and competitiveness of critical sectors or key goods from among those notified by at least three parties and to establish an IPEF Supply Chain Crisis Response Network as a body serving as an emergency communications channel during a supply chain disruption. Countries actually facing a supply chain disruption can share information and cooperate with parties to the agreement. At the leaders' meetings held after the ministerial meeting, the countries agreed to launch the IPEF Critical Minerals Dialogue, intended to foster close cooperative relationships to strengthen the supply chains of critical minerals.

In September 2024, the first in-person meetings of IPEF Supply Chain Council and the IPEF Supply Chain Crisis Response Network, established under the IPEF Supply Chain Agreement, were held, and four action plan teams, responsible for semiconductors, chemicals, critical minerals used in batteries, and healthcare, respectively, were established. Japan serves as vice chair of the Crisis Response Network, which conducted a tabletop exercise assuming a supply chain disruption.

(3) Japan, the United States, Australia, and India (QUAD group)

At the Quad Leaders' Meeting in May 2022, Japan, the United States, Australia, and India mapped the Quad's capacity and vulnerabilities in global semiconductor supply chains and decided to better leverage their complementary strengths to realize a diverse and competitive market for semiconductors. At the meeting, they issued the Common Statement of Principles on Critical Technology Supply Chains. At the Quad Leaders' Meeting in May 2023, the four countries issued the Quad Statement of Principles on Clean Energy Supply Chains in the Indo-Pacific in order to transition to sustainable and inclusive clean energy by promoting diverse, secure, transparent and resilient clean energy supply chains.

(4) Supply Chain Resilience Initiative (SCRI)

In April 2021, the Supply Chain Resilience Initiative (SCRI) was launched by the trade ministers of Japan, Australia and India in order for the three countries to cooperate in dealing with supply chain disruptions in the Indo-Pacific region. Under the SCRI, activities to enhance supply chain resilience have been conducted, including holding matching events and sharing best practices. Other activities conducted under the SCRI include the development of region-wide supply chain principles,

implementation of joint projects that contribute to the enhancement of supply chain resilience, and cooperation between industry, academia and government across the countries.

(5) Japan-ROK-U.S. Commerce and Industry Ministerial Meeting

Japan, the United States, and the ROK held the first Commerce and Industry Ministerial Meeting in June 2024 based on the agreement reached at the leaders' meeting held in August 2023 and agreed to cooperate in enhancing supply chain resilience in critical sectors, including semiconductors and storage batteries. At the ministerial meeting, the ministers held discussions on ways to strengthen trilateral cooperation in economic areas such as critical and emerging technologies, supply chain resilience, a level playing field, and clean energy. They also issued a joint statement on cooperating on specific sectors, such as semiconductors, AI, critical minerals, and clean energy.

(6) Minerals Security Partnership (MSP)

In order to ensure supply chain resilience concerning critical minerals essential to the clean energy transition (e.g., nickel, cobalt, and rare earths), the Minerals Security Partnership (MSP) was launched in June 2022 under the United States' leadership. The MSP is comprised of 15 members, including the G7, Australia, Finland, Norway, Sweden, Estonia, India, and the ROK (as of November 2024). Under the four pillars—(i) information sharing and cooperation, (ii) investment network, (iii) raising the standards concerning the environmental, social and governance (ESG) factors, and (iv) recycling and reuse—the MSP is conducting specific activities with the aim of ensuring that high-level ESG standards take hold and strategically inducing mine development, refining and processing activities, and investment based on the standards in order to address the oligopoly over the refining processes for critical minerals with a heavy environmental load.

4. Enhancing supply chain resilience concerning critical minerals

In discussions over the enhancement of supply chain resilience, issues related to critical minerals have been attracting particular attention in recent years. Critical minerals,[151] including rare metals, are used in lithium-ion batteries, high-performance motors, wind power turbines and semiconductors and are indispensable to advanced technologies and industries, including clean and digital technologies and industries. Toward the goal of realizing carbon neutrality by 2050, production of storage batteries, motors, semiconductors and other parts is expected to expand, and demand for mineral resources essential to the production is also projected to grow rapidly. In the 20 years through 2040, in the area of clean energy technology in particular, demand is projected to increase by a factor of around 13 for lithium and by a factor of more than six for each of cobalt and nickel, according to projections by the IEA.[152] In addition, as a result of an increase in demand for electric power for usages such as EVs, AI

[151] The definition of a critical mineral differs from country to country. In some cases, critical minerals include not only rare metals, such as lithium, but also base metals, such as copper.

[152] Under the STEPS scenario of the IEA (2021), regarding mineral resources (limited to those related to clean energy technology applications), demand is expected to increase 6.4-fold for cobalt, 12.8-fold for lithium, 6.5-fold for nickel, and 3.4-fold for rare earths compared with 2020.

and data centers due to the evolution of GX (green transformation) and DX (digital transformation), global demand for copper is expected to grow.[153]

In some cases, production of critical minerals is disproportionately concentrated in specific countries. Many types of critical minerals are produced in countries over which there are concerns about political instability. Moreover, as the markets for critical minerals are small compared with the markets for base metals such as steel and aluminum, those minerals are distinctive for their price volatility. In addition, for some critical minerals, a "supply-demand gap," that is, an excess of demand over supply, is expected to occur in the future, leading to intensified competition for resources between countries around the world, so ensuring stable supply has become a challenge.[154]

(1) Disproportionate concentration of critical minerals

Deposits and production of many types of critical minerals are disproportionately concentrated in specific countries, so developing resilient supply chains has become a challenge. One major characteristic of supply chain dependence is that not only production but also refining capacity is disproportionately concentrated in specific countries (Figure II-1-4-1). Refining capacity tends to be concentrated in countries with lower cost or with easier regulation, with China boasting a particularly high concentration.

In addition, the geological location of extraction does not necessarily match the location of headquarters of the mining companies. For example, in the case of nickel extraction, Indonesia has a share of 52% as a location of extraction, while Chinese companies have a share of around 40% from the viewpoint of the location of headquarters,[155] higher than the share of less than 10% for Indonesian companies.[156] Regarding cobalt, although most mines are located in the Democratic Republic of Congo, European companies and Chinese companies each have a one-third share as suppliers.

A higher degree of production concentration means a greater supply chain vulnerability to extreme weather events, trade conflicts, and disruptions due to geopolitical factors. This increases the risk that a significant supply shortage will arise when supply from a producing country has been disrupted. Moreover, supply chain oligopoly leads to a greater market control by specific countries or companies, heightening the risk of price control and coordination of production.

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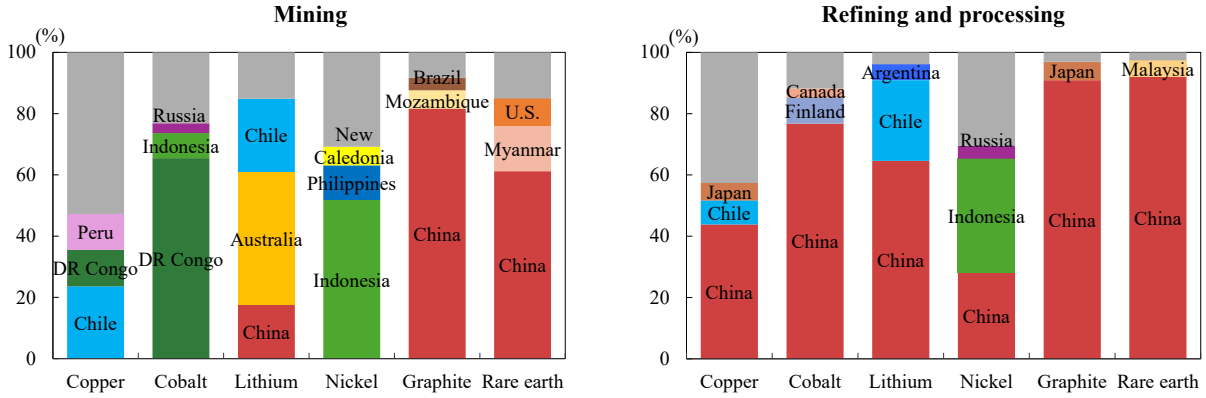
[153] Ministry of Economy, Trade and Industry, "SHIRYOU 3: KOUBUTSU SEISAKU WO MEGURU JOUKYOU NI TSUITE" (material at the 1st meeting of the Mining Subcommittee of the Manufacturing Industry Committee of the Industrial Structure Council), October 28, 2024, https://www.meti.go.jp/shingikai/sankoshin/seizo_sangyo/mining/pdf/001_03_00.pdf (as viewed on June 5, 2025)

[154] Ministry of Economy, Trade and Industry, "JUUYOU KOUBUTSU NI KAKARU ANTEI KYOUKYUU KAKUHO WO HAKARU TAMENO TORIKUMI HOUSHIN," (January 19, 2023, revised on March 29, 2024), https://www.meti.go.jp/policy/economy/economic_security/metal/torikumihoshin.pdf (as viewed on June 5, 2025)

[155] In the case of projects operated by multiple companies, this refers to the location (nationality) of the company with the largest share.

[156] IEA (2024)

Figure II-1-4-1. Shares of mining, refining and processing of critical minerals



Note: The data is from 2023. The category of rare earths only covers rare earth magnet elements.
Source: IEA (2024).

(2) Strengthening of control of mineral resources by resource-producing countries

As geopolitical risks related to mineral resources, IRENA cited the following six items: (i) external shocks (e.g., war, natural disasters, and pandemics), (ii) resource nationalism (e.g., expropriation and foreign investment screening), (iii) export restrictions (e.g., export bans, export quotas, and export taxes), (iv) mineral cartels (e.g., coordination of production, pricing, and market allocation), (v) political instability and social unrest (e.g., labor strikes and violence), and (vi) market manipulation (e.g., short squeezing and market cornering).[157] Here, we will look at moves by resource-producing countries to strengthen control of mineral resources, including resource nationalism and export restrictions.

In recent years, in some resource-rich countries, resource nationalism has been rising, as exemplified by efforts to strengthen state control of mineral resources and increase profits from extraction and implementation of measures to create value added (Table II-1-4-2). Specific measures included nationalization and expropriation of the mineral industry, export restrictions, strengthening of tax systems and royalty levying, and foreign investment regulation. Such moves of resource nationalism could affect global supply of critical minerals and raise concerns over whether the supply of raw materials can be secured.

[157] IRENA (2023)

Table II-1-4-2. Trends in resource-rich countries' policies for creating value added and their resource nationalism

Indonesia	Introduction of a policy for creating value added under the new, 2009 Mining Law (requiring domestic refining and processing to a certain level) Jan. 2020: Export ban on unprocessed nickel ore; Jun. 2023: Export ban on unprocessed bauxite ore; Plan for an export ban on unprocessed copper ore
Philippines	Study on policies for creating value added, including an export ban on nickel ore
Malaysia	Sep. 2023: Statement of formulation of policies for an export ban on rare earth raw materials
Chile	Apr. 2023: Announcement of the "National Strategy for Lithium," publishing a policy for advancing lithium development as a public-private partnership project under government control
Mexico	Apr. 2022: Enforcement of the amended Mining Law for lithium nationalization, stipulating that lithium is national property to be managed and controlled by the government and restricting the participation of the private sector
Democratic Republic of the Congo	2018: Passing and promulgation of the amended Mining Code, introducing the stricter measures for foreign investment, e.g., increased royalties on strategic mineral resources, than those under the former Mining Code
Zimbabwe	Dec. 2022: Export ban on unprocessed lithium ore

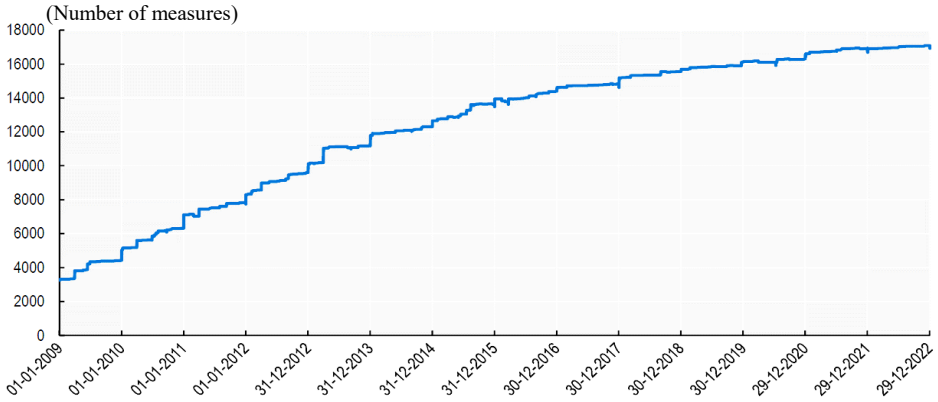
Sources: METI, JOGMEC.

In China, the regulation on rare earth control was put into effect in October 2024 in order to strengthen the control of the rare earth industry on a supply chain-wide basis. This regulation prescribes the specifics of strengthening of the conservation of rare earth resources, development of a system to control rare earths, initiatives to develop a high-quality rare earth industry, development of a system to control the entire chain of the rare earth industry, and the clarification of control measures and liability for illegal practices and also specifies state ownership of rare earths.

According to a report by the OECD, the global number of export restriction measures imposed against materials for industrial use[158] in 2022 increased by more than five-fold compared with 2009 (Figure II-1-4-3). As for means of export restriction, the introduction of export taxes and licensing requirements accounted for a great majority of the total number. However, in recent years, export bans have become popular as a means of export restriction: the number of export bans introduced has increased significantly since 2020 and accounted for the largest share in 2022.[159] China, India, Viet Nam, Argentina, and Saudi Arabia were the top five countries in terms of the number of new export restrictions introduced over the period from 2009 to 2022, accounting for more than half of the measures introduced (Figure II-1-4-4).

[158] The materials for industrial use referred to here comprise 58 types of minerals, metals, and metal wastes and scraps thereof, and six types of wooden products.
[159] OECD (2024)

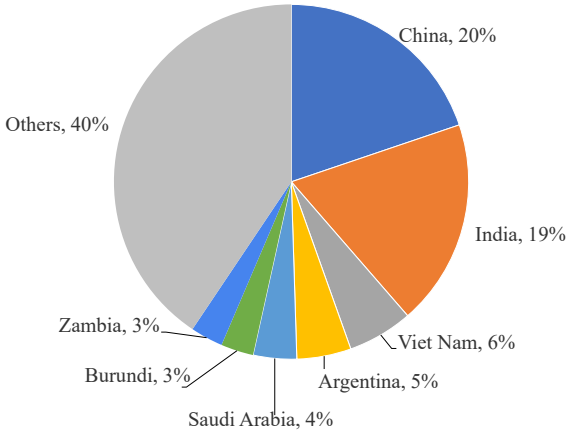
Figure II-1-4-3. Number of export restriction measures imposed on industrial raw materials



Note: Bilateral measures are excluded.

Source: OECD.

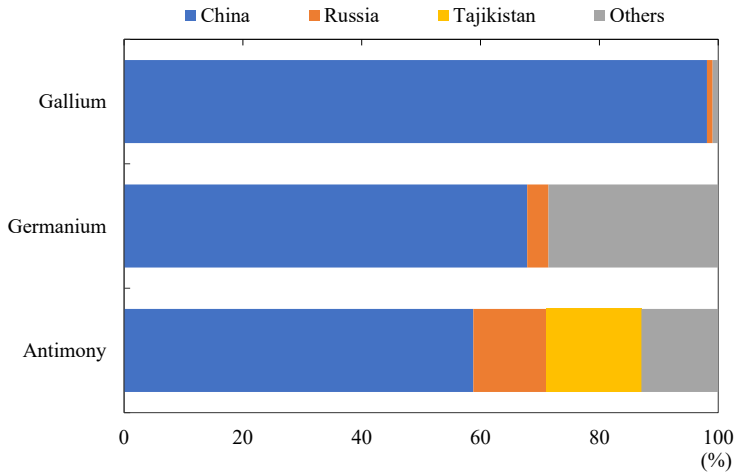
Figure II-1-4-4. Shares of export restriction measures imposed on industrial raw materials by country (2009-2022)



Source: OECD.

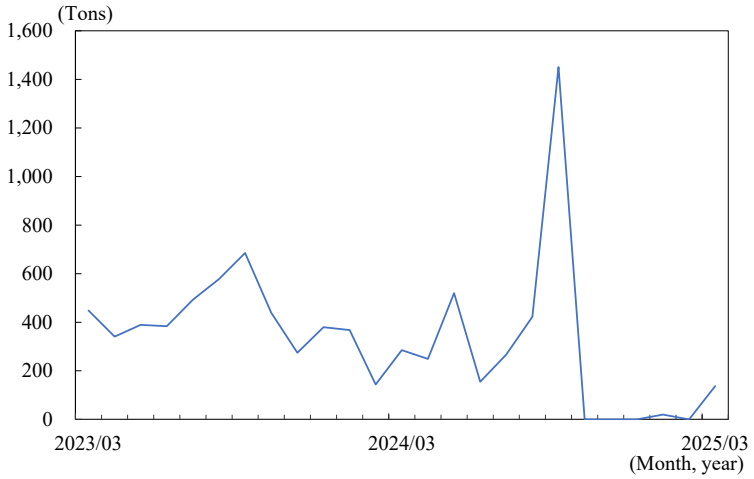
In particular, China, on which Japan depends for refining of many types of rare metals and rare earths, has implemented various trade control measures in recent years. China started export controls of items related to gallium and germanium, used as semiconductor materials, in August 2023, and of graphite-related items, used in automotive batteries, in December of the same year. In August 2024, it started export controls of items related to antimony, used as semiconductor materials. China started export controls of items-related to tungsten, tellurium, bismuth, molybdenum, and indium in February 2025 and of seven types of rare earth-related products, including samarium and gadolinium in April of the same year. The number of substances requiring export license by the government is increasing, and due to a lack of transparency over licensing enforcement, supply chain uncertainty is growing.

Figure II-1-4-5. Shares in the production of gallium, germanium, and antimony



Note: The data on germanium is from 2021, and the data on the rest of the critical minerals is from 2023.
Source: USGS.

Figure II-1-4-6. Changes in antimony products exported from China



Note: HS code: 8110.
Source: Global Trade Atlas.